

HF/50MHz ALL MODE TRANSCEIVER

# IC-756PROIII

## Take your DXing to the Next Level

+30dBm-class Third-order Intercept Point



Icom Inc.

# The 756PRO Series



# Legacy Continues to Grow

Icom and the renowned IC-756PRO series continue to make ham radio history:

- First 32-bit floating point DSP transceiver
- First transceiver with customizable filter shapes. There were no optional filters to buy, for none were needed.
- First mid-class HF transceiver with +30dBm-class third-order intercept point*
- First amateur HF transceiver with a large TFT color LCD

For the new IC-756PROIII, Icom's combined the cutting-edge receiver technology of the IC-7800 with the familiar ergonomics of the IC-756PROII.

Take your DXing to the next level with Icom's IC-756PROIII.

(*in the 14MHz band)






# The 756PRO Third

## New receiver gives +30dBm third-order intercept point*

Using receiver design techniques introduced in the IC-7800, Icom's engineering team focused on producing a distortion-free, high-dynamic-range. To achieve this goal, Icom used higher-grade components in vital receiver sections of the IC-756PROIII.

* Under the condition of receive frequency 14.2MHz, input frequencies 14.3MHz and 14.4MHz, Pre-amp OFF, mode USB BW: 2.4kHz

## Large inductors

The IC-756PROIII uses large inductors instead of small coils in the bandpass filter (BPF) stage, because small coils sometimes cause magnetic saturation in the BPF stage. Large inductors can handle both strong signals and weak signals with lower distortion.


Large inductors in the RF stage

## Low-distortion BPF switching

The BPF switching circuitry is one of the critical points in a receiver where distortion can be produced by strong out-of-band signals. Distortion at this early receiver stage then propagates throughout the remaining stages and cannot be removed by signal processing. The IC-756PROIII uses low distortion diodes with wide frequency characteristics that prevent formation of distortion components in the BPF stage.

## Fundamental-type 64MHz roofing filter

The IC-756PROIII uses a fundamental-mode monolithic crystal filter for the roofing filter. Although it's more expensive than overtone-mode filters, the fundamental-mode filter has a better shape factor and is less susceptible to intermodulation distortion under strong-signal conditions. This is the same 15kHz crystal filter used in the IC-7800 roofing filter circuit.


Fundamental-type roofing filter

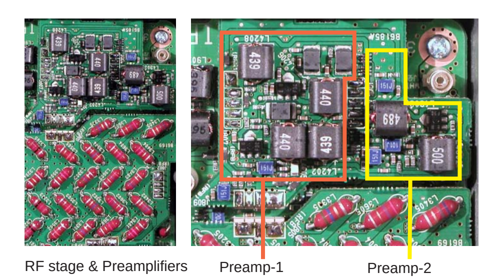
## Two newly designed preamplifier

To minimize distortion and maximize dynamic range, the IC-756PROIII preamplifiers use the same basic circuit design as the IC-7800 preamplifiers. Preamp-1 is a noiseless feedback design, with push-pull amplifiers. This design has a high intercept



# d Generation's new features

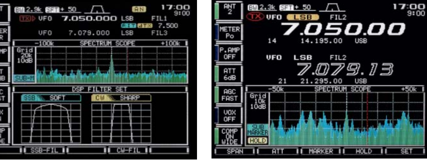
point and covers a wide frequency range. Preamp-2, which uses bipolar transistors for higher gain, is ideal when you use separate low-efficiency receiving antennas such as small loops or Beverages.



RF stage & Preamplifiers    Preamp-1    Preamp-2

## Real time spectrum scope with mini scope function

The real time spectrum scope is now an indispensable tool for top performing HF radios. The IC-756PROIII's spectrum scope adds a mini scope function, as requested by many PROII users. The mini scope allows you to monitor the scope screen while you use other function menus. For example, you can monitor the scope screen even while you are changing the IF filter shape and passband width. The scope range can be set in 4 steps ±12.5 kHz, ±25 kHz, ±50 kHz and ±100 kHz, centered on the receiving frequency. In addition, the spectrum scope has 3 attenuator levels (10dB, 20dB and 30dB).

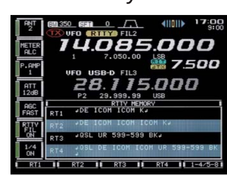


Mini scope screen    Normal spectrum scope screen

## Eight-channel RTTY TX memory

The IC-756PROIII has 8 channels of RTTY transmit memory. You can edit and send up to a 62 character message for each memory channel without a PC or other external unit*. The transmit memory is displayed on the screen so you won't send the wrong message. The built-in RTTY demodulator and decoder allow you to check the callsign of the station on the air instantly. A PC or external unit is not also necessary.

* When write and send RTTY messages on site, a Terminal Unit, TNC or PC and dedicated software is required.



RTTY transmit memory screen

## Adjustable SSB transmit BW

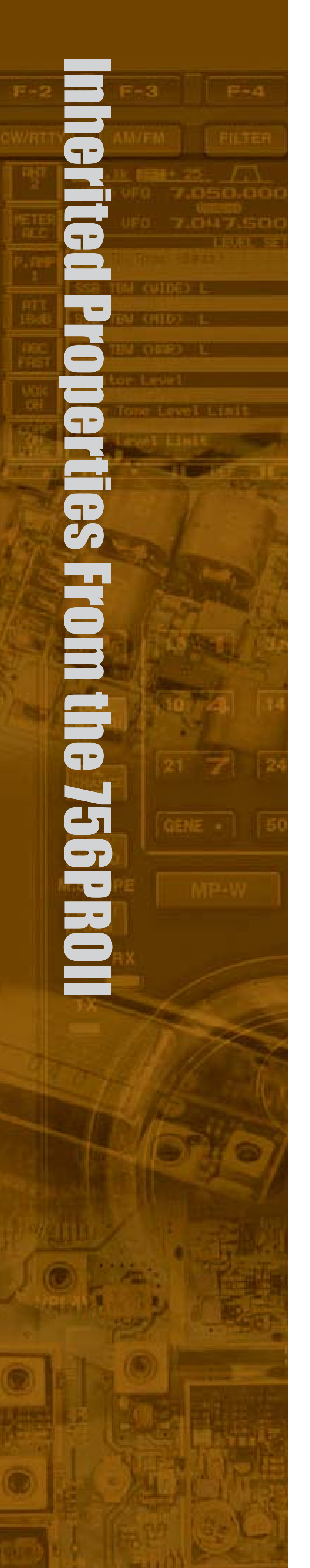
The SSB transmit bandwidth is selectable from 100, 300 and 500Hz at the high-pass edge, and 2500, 2700 and 2900Hz at the low-pass edge respectively. 3 types of high and low combinations can be stored in the memory. In addition, the built-in audio equalizer has separate bass and treble adjustments for a total of 121 combinations, so you can tone your voice up or down as you want. With this flexible DSP-based waveform shaping, you can tailor your transmit audio quality to suit your operating style.



SSB transmit bandwidth setting

## Other new features

- New 60 meter band coverage, equivalent transmit power and antenna tuner capabilities to the other bands.
  (U.S.A. version, USB mode only)
- 2 clocks show different time zones at once, such as local and UTC time.
- Screen saver function
- @ code (• – – • – • ), used in e-mail addresses, added to memory keyer




# Inherited Proper

## 32-bit floating point DSP & 24-bit AD/DA converters

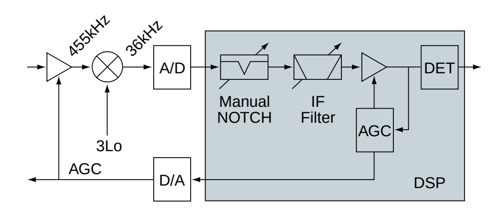
The heart of the IC-756PROIII is the proven combination of the 32-bit floating point DSP and 24-bit AD/DA converters. This powerful combination supports many digital processing features exclusive to the IC-756PROIII, which cannot be achieved with traditional analog processors. The 24-bit AD/DA converters have an ultra-wide dynamic range. The receiver delivers a distortion-free, clear sound in any signal condition, from a weak signal to a strong full power station.




## AGC loop management

The digital IF filter and manual notch filter are included in the AGC loop driven by the DSP. This architecture completely eliminates "AGC pumping" caused by adjacent strong signals out of the IF filter passband. In addition, programmable AGC time constants* (slow, medium, and fast presets) give flexibility and speed needed for working the pile-ups.

* Except FM mode.




## Dual watch

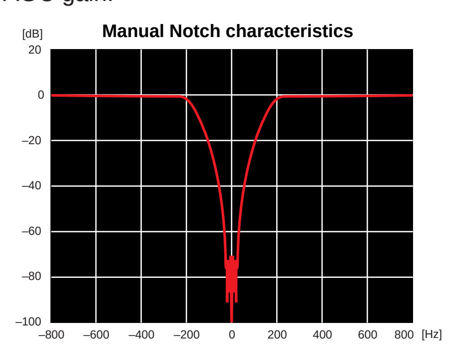
The dual watch* function allows you to receive 2 signals on the same band simultaneously. You can listen to your favorite net while keeping an eye or ear on the DX station. The signal strength balance between the main and sub frequencies is adjustable from the balance knob. (* Same band only)

## Digital twin PBT

DSP-based twin passband tuning (PBT) helps eliminate interference by changing the IF filter bandwidth and/or shifting the center frequency. With the digital IF filters, the PBT performance allows you to cut away all the interference and noise to hear the actual signal. The LCD indicates the twin PBT conditions across the top of the screen.

## Manual notch function

An incredible 70dB of attenuation is at your command with the manual notch. Eliminate strong adjacent signals or beat tone noise, without reducing the performance of the AGC gain.




## Sharp and soft filter shapes are selectable for SSB and CW mode

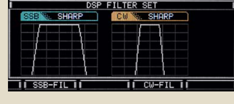
Select an appropriate filter shape, shape that favors your operating style or band conditions. Independent SSB and CW filter gives you the flexibility.

### SSB Sharp Filter

The perfect filter shape factor when signal fidelity or pinpoint accuracy is needed! A sharp slope from the filter edges gives full audio response while eliminating any adjacent interference.

### CW Sharp Filter

The "too good to be true" CW filter! The steep filter skirts — only 200Hz from the –6dB to the –60dB points — allow you to hear a weak CW signal that is surrounded by strong ones. DX hunters will have to try this one to really see the magic of the Sharp CW filter.



Filter shape setting – SSB, CW, sharp

### SSB Soft Filter

The perfect filter shape factor when trying to pick out a weak signal! The rounded filter shape resembles a traditional analog filter, by rolling off the high and low ends of the passband. Although maintaining the steep filter skirt characteristics of a digital filter, the soft filter increases the signal-to-noise ratio of the intended signal.

### CW Soft Filter

Running a pile-up has become easier with the soft CW filter. By broadening the filter skirt, the characteristics of the soft filter perform much like a mechanical filter without the ringing.

# ties From The 756PROII

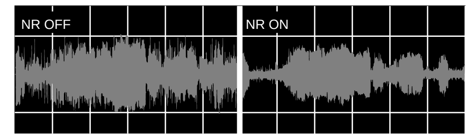
## Automatic notch function

Eliminate annoying AM carriers, amplifier or radio tune up interference with a push of a button. The automatic notch tracks 2 or more interfering signals simultaneously without intended signal loss or distortion. Very helpful on 80 and 160 meters.

## Adjustable noise reduction

The 32-bit DSP processing power produces real results by separating signal components from the noise with the variable Noise Reduction. By suppressing the noise components, an outstanding Signal-to-noise ratio is achieved, providing clear, clean audio in all modes without distortion of the target signal.

Audio output comparison

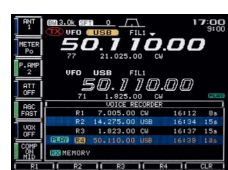



## Adjustable noise blanker

Reduce annoying QRN from pulse-type noise such as engine ignition systems and sparking appliance motors, with the fully adjustable (101 steps) noise blanker.

## Digital voice recorder

The Digital Voice Recorder (DVR) is a very convenient function for contests, DXpeditions and even normal operation. Record your callsign, CQ, or other station information into four memory locations. A total of 90 seconds is available for the four memories, with each memory channel being soft partitioned to allow custom recording sizes. A quick push of the front-panel DVR button allows you to record received signal into the R4 memory. The playback automatically mutes the receiver for clear playback of the previous 15 seconds of recorded audio. The perfect feature for those contest operators wanting to improve their UBN.



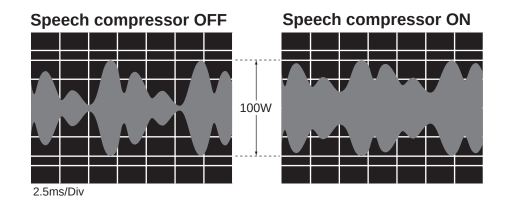
Digital voice recorder

## CW memory keyer

A must have feature for the CW operator, the internal memory keyer provides 4 memories for programming station information, calling CQ and callsign. Each memory has a capacity of 55 characters, as well as other time saving functions such as automatic repeat, serial contest number auto-counter, and morse cut number functions.

## Digital RF speech compressor

The IC-756PROIII utilizes the 32-bit DSP for the RF speech compressor providing the maximum punch without the fuzzy sound. Great for breaking through the noise and hash to complete the QSO.




## Highly stable transmitter

For a big, clear signal, the IC-756PROIII uses two 2SC5125 transistors in the PA Unit. Along with superior IMD characteristics, these transistors have plenty of power to allow for 100W full duty cycle operation. Advanced design considerations along with an aluminum, die-cast frame, and large cooling fan, help to stabilize the PA circuit providing full duty cycle operation.

## High stability crystal unit

The IC-756PROIII incorporates a high-stability master oscillator, providing ±0.5ppm (–10ºC to +50ºC). A must for RTTY, SSTV or MARS operation.



Crystal oscillator

## Triple band stacking register

Hop around the band with Icom's exclusive triple band stacking registers. Each band remembers the last 3 frequencies, mode and other settings used.

## SSB data communication

When the IF filter passband is reduced to 500Hz or less in SSB/SSB data mode, special bandpass filters are automatically selected. The BPF automatically sharpen for better rejection of interfering signals. Along with the BPF, the IC-756PROIII automatically turns off the compression and enables the 1/4-tuning step for easier operation and more accurate tuning. Perfect for PSK31, SSTV or other AFSK modes.

## 5-inch TFT color LCD

Enjoy the full 5-inch TFT color display. The IC-756PROIII has 8 colors of display settings and 7 types of font settings. Various information is indicated on the color LCD, separated into an upper and lower screen. The lower screen can spread vertically to increase the information viewing area.

## Other features

**[Antenna and receiver]** • Built-in high-speed auto antenna tuner • 2 TX/RX antenna connectors and RX antenna connector • 30kHz–60MHz general coverage receiver* • Built-in RX attenuator (6/12/18dB) • Twin peak audio filter for RTTY reception

**[Transmitter]** • Tx monitor function • Tone encoder • VOX operation • All mode power control • External Control for Voice Memory and Memory Keyer

**[CW mode]** • CW Wave form controlled by the DSP • Multi-function electronic keyer includes adjustable keying speed and dot/dash ratio, polarity, bug keyer • Continuously adjustable CW pitch control from 300–900Hz • Double key jacks (Front and rear panels) • Full break-in (QSK) • CW reverse

**[Operation]** • Set mode menu for speedy setting • Analog and digital meter indicates relative output power, SWR, ALC level and compression level • Memory pad stores up to 5 or 10 operating frequencies and modes • Quick split function • RF gain and squelch control • ±9.999kHz Adjustable RIT and ⊿TX • 1Hz step tuning and display • 101 memory channels with 10-character channel name • Optional Voice synthesizer announces the operating frequency, mode and signal strength in English • Program, memory, select memory, ⊿f scans • Auto tuning step function • Dial lock • Band edge beep (can be disabled) • AH-4 control circuit • Automatic tuning speed • CI-V interface with optional CT-17 for PC remote control

(* Depending on version)

**•Rear View**



## SPECIFICATIONS

### GENERAL

- Frequency coverage :

USA version

| | | |
|---|---|---|
| Rx | 0.030– 60.000MHz*1 | |
| Tx | 1.800– 1.999MHz | 3.500– 3.999MHz |
| | 5.3305, 5.3465, 5.3665, 5.3715, 5.4035MHz*2 | |
| | 7.000– 7.300MHz | 10.100–10.150MHz |
| | 14.000– 14.350MHz | 18.068–18.168MHz |
| | 21.000– 21.450MHz | 24.890–24.990MHz |
| | 28.000– 29.700MHz | 50.000–54.000MHz |

Europe version

| | | |
|---|---|---|
| Rx | 0.030– 60.000MHz*1 | |
| Tx | 1.810– 1.999MHz | 3.500– 3.800MHz |
| | 7.000– 7.100MHz | 10.100–10.150MHz |
| | 14.000– 14.350MHz | 18.068–18.168MHz |
| | 21.000– 21.450MHz | 24.890–24.990MHz |
| | 28.000– 29.700MHz | 50.000–52.000MHz |

*1 Some freq. bands are not guaranteed. *2 USB mode only

- Mode : USB, LSB, CW, RTTY, AM, FM
- Number of memory Ch. : 101 (99 regular, 2 scan edges)
- Antenna connector : SO-239×2 and phono [RCA; (50Ω)]
- Temperature range : –10˚C to +50˚C; +14˚F to +122˚F
- Frequency stability : Less than ±0.5ppm (1 min. after power ON; 0˚C to 50˚C; +32˚F to +122˚F)
- Frequency resolution : 1Hz
- Power supply requirement : 13.8V DC ±15% (negative ground)
- Power consumption : Tx Max. power 23A; Rx Standby 3.0A (typ.); Max. audio 3.5A (typ.)
- Dimensions (projections not included) : 340(W)×111(H)×285(D) mm; 13⅜(W)×4⅜(H)×11⁷⁄₃₂(D) in
- Weight (approx.) : 9.6kg; 21lb 1oz

The LCD display may have cosmetic imperfections that appear as tiny spots. This is not a malfunction or defect, but a normal characteristic of LCD displays.

**All stated specifications are subject to change without notice or obligation.**

### TRANSCEIVER

- Output power (continuously adjustable) : SSB, CW, RTTY, FM 5–100W; AM 5–40W
- Modulation system : SSB DPSN modulation; AM Digital low power modulation; FM Digital phase modulation
- Spurious emission : Less than –50dB (HF bands); Less than –60dB (50MHz band)
- Carrier suppression : More than 40dB
- Unwanted sideband suppression: More than 55dB
- Microphone connector : 8-pin connector (600Ω)

### RECEIVER

- Receive system : Triple conversion superheterodyne system
- Intermediate frequencies : 1st 64.455MHz (for all modes); 2nd 455kHz (for all modes); 3rd 36kHz (for all modes)
- Sensitivity (typical) :

| Frequency Range (MHz) | SSB, CW, RTTY (at 2.4kHz BW) | AM (at 6kHz BW) | FM (at 15kHz BW) |
|---|---|---|---|
| 0.50–1.799 | — | 13µV | — |
| 1.80–27.99 | 0.16µV*1 | 2µV*1 | — |
| 28.0–29.99 | 0.16µV*1 | 2µV*1 | 0.5µV*1 |
| 50.0–54.0 | 0.13µV*2 | 1µV*2 | 0.32µV*2 |

10dB S/N for SSB, CW, RTTY and AM, 12dB SINAD for FM
*1Pre-amp 1 is ON, *2Pre-amp 2 is ON

- Squelch sensitivity (Pre-amp: OFF): SSB, CW, RTTY Less than 5.6µV; FM Less than 1µV
- Selectivity (representative value):

| | |
|---|---|
| SSB, RTTY (BW: 2.4kHz) | More than 2.4kHz/–6dB |
| | Less than 3.2kHz/–40dB |
| | Less than 3.6kHz/–60dB |
| | Less than 4.3kHz/–80dB |
| CW (BW: 500Hz) | More than 500Hz/–6dB |
| | Less than 700Hz/–60dB |
| AM (BW: 6kHz) | More than 6.0kHz/–6dB |
| | Less than 15.0kHz/–60dB |
| FM (BW: 15kHz) | More than 12.0kHz/–6dB |
| | Less than 20.0kHz/–60dB |

- Spurious and image rejection ratio : More than 70dB (except IF through on 50MHz band)
- AF output power (at 13.8V DC) : More than 2.0W at 10% distortion with an 8Ω load
- RIT variable range : ±9.999kHz
- PHONES connector : 2-pin connector 6.35 (d) mm (¼″)
- EXT SP connector : 2-pin connector 3.5 (d) mm (⅛″)/8Ω

### ANTENNA TUNER

- Matching impedance range: HF bands 16.7–150Ω unbalanced*1; 50MHz band 20–125Ω unbalanced*2

*1Less than VSWR 3:1; *2Less than VSWR 2.5:1

- Min. operating input power: 8 W
- Tuning accuracy : VSWR 1.5:1 or less (SWR after the motor stopped)
- Insertion loss : Less than 1.0dB (after tuning)

**Supplied accessories:**
- Hand microphone
- DC power cable
- Spare fuses
- CW key plug

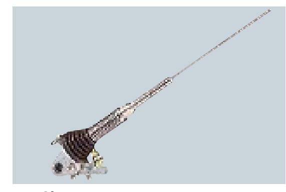
## OPTIONS



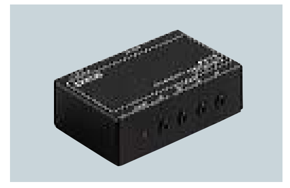
**IC-PW1/IC-PW1EURO** HF+50MHz 1kW LINEAR AMPLIFIER
Covers all HF and 50MHz bands, provides clean, stable 1kW output. Automatic antenna tuner and compact detachable controller are standard. 2 exciter inputs are available.



**AH-4** HF+50MHz AUTOMATIC ANTENNA TUNER
Covers 3.5–54MHz with a 7m (23 ft) or longer wire antenna.



**AH-2b** ANTENNA ELEMENT
A 2.5m long antenna element for mobile operation with the AH-4. All amateur bands between 7–54 MHz can be matched.



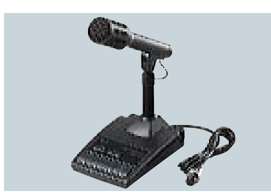
**CT-17** CI-V LEVEL CONVERTER
For remote transceiver control using a PC equipped with an RS-232C port. You can change frequencies, operating mode, etc.



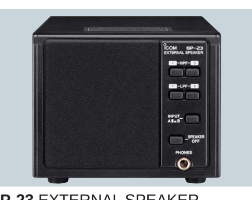
**HM-36** HAND MICROPHONE
Same as supplied.



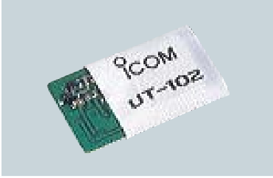
**PS-125** DC POWER SUPPLY
Style and size are matched to the IC-756PROIII.
13.8V DC, 25A max.



**SM-20** DESKTOP MICROPHONE
Unidirectional, electret microphone for base station operation. [UP/DOWN] switches and a low cut function are available.



**SP-23** EXTERNAL SPEAKER
4 audio filters; headphone jack.
Input impedance: 8Ω
Max. input power: 5W




**UT-102** VOICE SYNTHESIZER UNIT
Announces operating frequency and mode in English.

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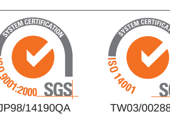
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